PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Kosuke TAKASAKI, et al.

Appln. No.: 10/807,348

Confirmation No.: 5375

Filed: March 24, 2004

Docket No: Q80473

Group Art Unit: 2812

Examiner: Stanetta D. ISSAC

For: SOLID-STATE IMAGING DEVICE AND METHOD FOR MANUFACTURING THE SAME

SUBMISSION OF SUPPLEMENTAL APPEAL BRIEF

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find a Supplemental Appeal Brief.

The Appellant's undersigned representative contacted Miss Darlene Brown on October 30, 2007 to clarify the Notification of Non-Compliant Appeal Brief. The status of the claims on Appeal has now been corrected in the Appendix of the Claims and in the "Status of the Claims." Ms. Brown indicated that box 3 was incorrectly marked in the Notification of Non-Compliant Appeal Brief and she meant to mark box 2. Therefore, the statement regarding the status of each Amendment is correct.

The statutory fee of $500.00 was previously charged to Deposit Account No. 19-4880 via EFS Payment Screen, therefore Appellant believes that no fees are due at this time. However, the USPTO is also directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Ruthleen E. Uy/

Ruthleen E. Uy
Registration No. 51,361

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: October 31, 2007

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Kosuke TAKASAKI, et al.

Appln. No.: 10/807,348

Confirmation No.: 5375

Filed: March 24, 2004

Docket No: Q80473

Group Art Unit: 2812

Examiner: Stanetta D. ISSAC

For: SOLID-STATE IMAGING DEVICE AND METHOD FOR MANUFACTURING THE SAME

SUPPLEMENTAL APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

Table of Contents

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Fujifilm Corporation, Tokyo Japan, the assignee. The assignment was recorded on February 15, 2007, at Reel 018904, Frame 0001.

II. RELATED APPEALS AND INTERFERENCES

A Notice of Appeal and Pre-Appeal Brief Request for Review was previously filed on July 31, 2006. In response to the filing of the Notice of Appeal and Pre-Appeal Brief Request for Review, a Non-Final Office Action was mailed on November 17, 2006.

There are no other appeals or interferences known to Appellant, Appellant's legal representative, or the assignee that will directly affect or be directly affected by, or have a bearing on, the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-23 are pending in the present application. Claims 1-16 and 23 stand finally rejected and are being appealed. Claims 17-22 have been withdrawn from consideration.

Claims 1-16 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto (U.S. Patent No. 7,001,797; hereinafter "Hashimoto") in view of Shimoda et al. (U.S. Patent No. 6,887,650; hereinafter "Shimoda").

No other ground of rejection or objection is currently pending.

A copy of the pending claims on appeal is set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

Amendments to the claims were submitted in an Amendment Under 37 C.F.R. § 1.111 filed January 18, 2006, in response to the Non-final Office Action dated October 18, 2005. Amendments to the claims were submitted in an Amendment Under 37 C.F.R. § 1.116 filed June 27, 2006, in response to the Final Office Action dated April 6, 2006. An Advisory Action was issued on July 12, 2006. The Advisory Action indicates that the response filed June 27, 2006, has been considered but did not place the application in a condition for allowance. A Notice of Appeal and Pre-Appeal Brief Request for Review were filed on July 31, 2006. A Response Under 37 C.F.R. § 1.111 was filed on February 20, 2007, in response to the Non-final Office Action dated November 17, 2006. A Response Under 37 C.F.R. § 1.116 was filed on June 25, 2007, in response to the Final Office Action dated April 24, 2007. An Advisory Action was issued on July 9, 2007 which indicates that the Response filed June 25, 2007 has been considered but did not place the application in a condition for allowance. A Notice of Appeal was filed on July 24, 2007, in response to the Final Office Action dated April 24, 2007 and the Advisory Action dated July 9, 2007.

All amendments and arguments are believed to have been previously entered and made of record.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellant's invention as recited in, for example, independent claim 1 is directed to a method for manufacturing a solid-state imaging device.

Digital cameras, equipped with a solid-state imaging device and a semiconductor memory device, are widely spread among consumers. In addition, small electric apparatuses, such as mobile phones and personal digital assistants (PDA), have a solid-state imaging device and a memory device which enables digital photography. See Appellant's specification at page 1, lines 11-15.

A method of manufacturing a solid-state imaging device is the wafer level CSP technique in which plural spacers are formed on the glass substrate as the cover glass. Then, after adhesives are applied to the edge surface of the spacers, the glass substrate is adhered to a wafer on which plural solid-state imaging element chips are formed. The wafer with the glass substrate is subjected to a dicing process to manufacture the solid-state imaging device. See Appellant's specification at page 2, lines 12-18.

It is necessary to provide a space between the solid-state imaging element and the spacer for the purpose of preventing flare that is caused by entering incident light, which is reflected on the inner surface of the spacer, into the solid-state imaging element. Moreover, since the spacer is pressed onto the solid-state imaging device to generate a stress during the bonding process, the spacer and the solid-state imaging device are distorted. Thus, the space between the solid-state imaging element and the spacer is necessary for preventing such distortion to the solid-state imaging device. Furthermore, because the solid-state imaging element generates heat when the solid-state imaging device is operated at a high clock rate or takes an image for a long exposure time, the difference in thermal expansion rate between the solid-state imaging element chip and

the spacer causes stress. The space between the solid-state imaging element and the spacer is necessary to prevent such stress from affecting the solid-state imaging element. See Appellant's specification at page 2, line 19 to page 3, line 8.

In order to bond the spacer properly to the wafer, it is necessary to consider the width of the frame-shaped spacer. If the width of the spacer is too large, an improper bonding will happen because of air remaining inside the adhesive. Moreover, a large width spacer will make it difficult to decrease the size of the solid-state imaging device. Thus, the manufacturing cost will increase because of the small number of solid-state imaging devices per wafer. On the other hand, if the width of the spacer is too narrow, the solid-state imaging device will be physically weak. See Appellant's specification at page 4, lines 4-13.

In the prior art, in order to prevent an adhesive from flowing into the solid-state imaging element, the distance between the solid-state imaging element and the spacer is lengthened. However, this increases the manufacturing cost because of difficulty in miniaturizing the solid-state imaging device. See Appellant's specification at page 4, lines 14-19.

An exemplary embodiment of the Applicant's invention addresses the deficiencies in the prior art.

Claim 1

A method for manufacturing a solid-state imaging device (see for example Figs. 1 and 2, reference numeral 2) by adhering a transparent substrate (see for example, Fig. 5, glass substrate 10), in which a plurality of frame-shaped spacers (see for example, reference numeral 6) are formed, via an adhesive (see for example, Fig. 2, reference numeral 12) to a wafer (see for example, Fig. 2; see also page 11, lines 13-16) on which plural solid-state imaging elements (see for example, Fig. 2, reference numeral 3) are formed, and by dividing the transparent substrate

(see for example, Fig. 5, glass substrate 10) and the wafer (see for example, Fig. 2) for each solid-state imaging element (see for example, Fig. 2, reference numeral 3), each of the solid-state imaging elements on the wafer being surrounded by each of the plurality of spacers, the method comprising the steps of:

adhering a transfer member (see for example, Fig. 7A, transfer film 16; see also page 13, lines 15-16), to which the adhesive is applied, to the plurality of spacers (see for example, reference numeral 6) formed on the transparent substrate; (see for example, Figs. 6, 7A and 7B; see also page 13, line 11 to page 14, line 24)

applying pressure to the transparent substrate (see for example, Fig. 5, glass substrate 10) and the transfer member, which is adhered to the plurality of spacers (see for example, reference numeral 6) formed on the transparent substrate (see for example, Fig. 5, glass substrate 10); (see for example, Figs. 7A and 7B; see also page 15, lines 11-21) and

releasing the transfer member (see for example, Fig. 7A, transfer film 16; see also page 13, lines 15-16) from the transparent substrate (see for example, Fig. 5, glass substrate 10) to transfer the adhesive, which is applied to the transfer member (see for example, Fig. 7A, transfer film 16; see also page 13, lines 15-16), from the transfer member (see for example, Fig. 7A, transfer film 16; see also page 13, lines 15-16) onto the plurality of spacers (see for example, reference numeral 6) formed on the transparent substrate. (see for example, Fig. 8; see also page 15, lines 22-26)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-16 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto in view of Shimoda.

VII. ARGUMENT

I. The combination of Hashimoto with Shimoda does not teach the claimed elements

Claims 1-16 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto (U.S. Patent No. 7,001,797) in view of Shimoda et al. (U.S. Patent No. 6,887,650).

Claim 1 recites "adhering a transfer member, to which the adhesive is applied, to the plurality of spacers formed on the transparent substrate." The Examiner asserts that spacer 44 of cover 40, as illustrated in Fig. 4 of Hashimoto, teaches the claimed spacer.

Hashimoto is directed to the attachment of covers to a substrate on which are formed a plurality of optical elements. See abstract. Hashimoto discloses a cover 40 which includes a plate 42 and a spacer 44 which are constructed as separate members. The plate 42 and the spacer 44 may be joined with adhesive. See Hashimoto col. 5, lines 23-29.

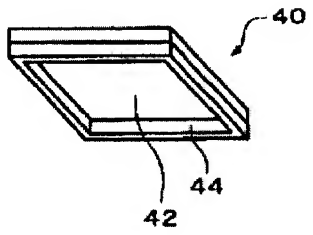

Fig. 4 of Hashimoto

Further, Hashimoto relates to a method of manufacturing optical devices, such as imaging devices having microlenses, in which the optical lenses are cut apart and diced. See Hashimoto at col. 1, lines 12-34. As taught by Hashimoto, a substrate 10 has a plurality of optical elements 60, which respectively include optical sections 14, and each optical section has a plurality of energy transducers 16. See Hashimoto at col. 4, lines 4-26 and Fig. 2. Further, Hashimoto teaches that a cover 30, which comprises plate 32 and spacer 34 formed integrally, is provided to

seal the optical section 30, such that the spacer 34 is disposed to surround the optical section 14 and support the plate over the optical section 14. See Hashimoto at col. 4, lines 47-60 and Fig. 3.

In attaching the cover 30 to the substrate 10, Hashimoto teaches that an adhesive, which is not even shown in Hashimoto's drawings, may be applied to "at least one of the cover 30 (spacer 34) and the substrate 10" in order to seal the optical section 14 prior to separation of the substrate to form individual optical elements 60 by a dicing blade. See Hashimoto at col. 5, lines 40-67. According to Hashimoto, since the optical sections 14 are sealed before the substrate 10 is separated, no debris enters the sealed chamber during the cutting process. See Hashimoto at col. 6, lines 9-12.

The Examiner concedes that Hashimoto does not disclose adhering a transfer member, to which the adhesive is applied, to the plurality of spacers formed on the transparent substrate and cites Shimoda to cure the deficiency.

However, contrary to the Examiner's assertions, Shimoda is not at all directed to spacers. Specifically, at no point are spacers as claimed disclosed throughout the specification of Shimoda.

Shimoda teaches a transfer method for transferring a thin film device between substrates "without it being necessary to carry out a step of dividing (dicing) into chips or the like." See Shimoda at col. 2, lines 40-45. Shimoda discloses the adhesion of a transferred body 2a to a transfer destination substrate 3. A plurality of transferred bodies 2a are formed on a transfer origin substrate 1.

Fig. 1B

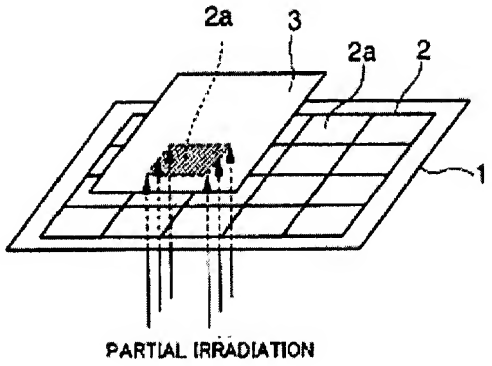

Fig. 1B of Shimoda

Energy is applied to partial regions corresponding to the transferred body 2a so as to transfer the transferred body 2a corresponding to the partial regions onto a transfer destination substrate 3. See col. 13, lines 39-46. The transferred bodies are formed on a light-transmitting heat-resistant transfer original substrate 1 via a peeling layer in which peeling occurs if energy is applied. See col. 13, lines 46-55.

Further, as discussed in col. 3, lines 20-30, "`transferred bodies` refers to TFTs, diodes, resistors, inductors, capacitors, and other single devices that may be either active or passive, circuits (chips) such as integrated circuits in which devices are integrated and wired together so as to achieve a specific function, circuit parts comprising a combination of a plurality of devices, and whole apparatuses or apparatus parts that are constituted by combining one or more circuits such as integrated circuits so as to achieve a specific function." Thus, Shimoda's teaching is directed to an alternative of using a conventional "dicing" technique of mechanically separating, or cutting, individual circuit components from a common layer or substrate, in which separation from the substrate can be selectively achieved by exposure of energy to the substrate.

Shimoda at most discloses the transfer of transferred bodies 2a to a transfer destination substrate 3 via a peeling layer. However, at no point would the peeling layer (transfer member

as cited by the Examiner) be adhered to the spacers of Hashimoto. Specifically, if the peeling layer of Shimoda were applied to the spacer of Hashimoto, this would result in the placement of the transferred bodies 2a onto the plate 42 of the cover 40 of Hashimoto. As discussed in col. 14, lines 7-11 of Shimoda, by applying energy to the region of the peeling layer where the transferred body 2a is formed, transfer occurs in which only the transferred body 2a to which the energy has been applied is joined onto the transfer destination substrate 3. Therefore, the application of the peeling layer to Hashimoto would not teach adhering a transfer member, to which the adhesive is applied.

Further, the peeling layer of Shimoda would not adhere to a spacer. As disclosed in col. 17, lines 40-59 of Shimoda:

> The peeling layer 11 has the property of absorbing irradiated light, whereby peeling occurs within the layer and/or at the interface thereof (referred to as `in-layer peeling` and `interfacial peeling` respectively); preferably, the peeling layer 11 is such that the bonding strength between atoms or molecules of the material that constitutes the peeling layer 11 is lost or reduced upon irradiation with light, i.e. ablation occurs, leading to in-layer peeling and/or interfacial peeling.
>
> Furthermore, it may be the case that a gas is discharged from the peeling layer 11 upon irradiation with light, whereupon a separation effect is realized. That is, it may be the case that a component that was contained in the peeling layer 11 turns into a gas and is discharged, or the case that the peeling layer 11 absorbs light and turns into a gas instantaneously, and this vapor is discharged, contributing to separation. Examples of the constitution of the peeling layer 11 include the following A to E.

Therefore, the application of the peeling layer to a spacer of Hashimoto would merely result in the peeling layer turning into a gas which is consequently discharged. Therefore, the combination of the peeling layer of Shimoda with the spacer of Hashimoto would not teach adhering a transfer member, to which the adhesive is applied, to the plurality of spacers formed on the transparent substrate, as claimed.

Moreover, the "peeling layer" of Shimoda, simply refers to a layer that absorbs irradiated light, thereby resulting in a reduction of bonding strength and separation of the transferred bodies in the region exposed to radiation. See Shimoda at col. 17, lines 42-49. Shimoda expressly teaches that, to the extent that any "peeling residue from the peeling layer 11 remains attached to the transferred bodies 12a after transfer onto the second substrate 26 side", it is "preferable to completely remove this peeling residue." See Shimoda at col. 42, lines 63-67.

Thus, Appellant submits that Shimoda's teaching of separating transferred bodies from a transfer substrate by selective exposure of radiation to avoid dicing would not have *any* application to Hashimoto's teaching of manufacturing optical devices, in which a optical lenses are cut apart and diced. Further, Appellant submits that there is no support for the Examiner's contention that Shimoda teaches the use of "spacers" that have an adhesive material formed thereon, which could in any way be construed as equivalent to the spacer 34 of Hashimoto.

As discussed above, Shimoda's teaching is directed to separation of an entire "transferred body", such as a TFT, diode, resistor, or other circuit element, from an initial substrate, not for transferring adhesive to a structural element of an imaging device (i.e., spacers), such as claimed in method claim 1. Therefore, Appellant submits that there is no suggestion that Shimoda's teaching could be applied to transfer adhesive, as recited by claim 1, in which adhesive applied to the transfer member is released from the transfer member onto the plurality of spacers formed on the substrate.

Contrary to the Examiner's assertions, the use of the peeling layer of Shimoda does not have an equivalent function of bonding two surfaces with an adhesive. Specifically since the peeling layer (transfer member as cited by the Examiner) of Shimoda is not directed to bonding two substrates together as suggested by the Examiner.

Claim 1 further recites "applying pressure to the transparent substrate and the transfer member, which is adhered to the plurality of spacers formed on the transparent substrate." The Examiner asserts that Fig. 1A and col. 5, lines 35-39 of Hashimoto teaches this aspect of the claim. The respective column and lines cited by the Examiner discloses that the plurality of covers 30 can be applied to a sheet 36 so that a plurality of covers are held in fixed relative positions. However, there is no teaching or suggestion of applying pressure to the cover 30.

Claim 1 further recites "releasing the transfer member from the transparent substrate to transfer the adhesive, which is applied to the transfer member, from the transfer member onto the plurality of spacers formed on the transparent substrate." However, there is no teaching as to how the adhesive, which is not shown in the figures of Hashimoto, are applied to the cover. Specifically, there is no transfer of an adhesive when using the peeling layer of Shimoda. Shimoda is directed to the transfer of a transfer body, such as TFTs, diodes, resistors, inductors, and capacitors, and does not teach the transfer of an adhesive. Therefore, assuming Shimoda were combined with Hashimoto, this would appear to result in the transfer of a transfer body on the spacer of Hashimoto. At no point is there any teaching or suggestion of transferring an adhesive from the transfer member onto the plurality of spacers.

Further, Shimoda transfers electric components such as a TFT or a diode but not an adhesive as pointed out above. Thus, Shimoda belongs to a *different* technical field entirely than that of the present invention and Shimoda is therefore inappropriately cited in the Office Action. Although the Examiner is merely citing the peeling layer of Shimoda, the peeling layer of Shimoda does not transfer an adhesive.

For instance, although Shimoda describes transferring the transferred body 2a by use of adhesive, Shimoda is silent on transferring the adhesive itself *to the spacers*. Moreover, since

"the 'peeling layer' should be fanned from a material for which the bonding stone). .. weakens upon the application of the energy" (column 6, lines 27-30), the peeling layer of Shimoda does not correspond to the adhesive layer of claim 1.

Appellant further notes, with regard to Fig. 20A in Shimoda, the temporary adhesive layer 26a is fanned by spin coating, ink jet coating or printing (column 42, lines 38-42) but *not* by transferring the adhesive as in the claimed method. In addition, unlike Shimoda, the solvent-dissolvable adhesive is not used in the method of claim 1.

Although the element 28C in Fig. 20C of Shimoda is an adhesive layer, it has been already cured to adhere the transferred body. On the other hand, the adhesive layer is transferred before cured in accordance with an exemplary embodiment of the claimed method. Moreover, the adhesive layer of Shimoda is applied to the substrate 27 but not to the transferred body 12.

Moreover, the ultimate goal of Shimoda is not "to form an adhesive material onto the spacers" (Office Action page 5) contrary to the Examiner's assertion, but rather to manufacture some device effectively by preparing the substrate onto which the transferred body is transferred. Rather, the detailed explanation of the method of manufacturing the device is not shown in Shimoda, but only the method of transferring the transferred body to the substrate is shown.

With regard to Fig. 14A-15 in Shimoda, although the adhesive tape is used to fix the transferred body, i.e.,. an electric element, the adhesive itself is not transferred. Therefore, assuming the adhesive of the present application corresponds to the transferred body of Shimoda, the objects of the both inventions are completely different from each other. Moreover, unlike this invention, the adhesive of Shimoda is partially cured. Shimoda merely discloses using an adhesive tape, but does not teach or suggest transferring uncured adhesive as in the present invention.

In the Advisory Action of July 9, 2007, the Examiner asserts that the use of a transferring member would prove to be equivalent in its functionality of bonding the two surfaces with an adhesive, since ultimately the goal is to form an adhesive material onto the spacers and to later bond the two substrates to each other. Applicant submits that the goal of Shimoda is not to form an adhesive material onto a spacer. As previously indicated, the application of the peeling layer to a spacer of Hashimoto would merely result in the peeling layer turning into a gas which is consequently discharged. Further, as no adhesive is disclosed in Shimoda, the use of a transfer member is not equivalent in its functionality to bonding two surfaces with an adhesive.

Further, Appellant submits that Shimoda's teaching of separating transferred bodies from a transfer substrate by selective exposure of radiation to avoid dicing would not have *any* application to Hashimoto's teaching of manufacturing optical devices, in which optical lenses are cut apart and diced.

As noted previously, since Hashimoto is silent on a transfer member, the Examiner has cited Shimoda to cure this deficiency. However, even assuming that the tape carrier F of Shimoda (Fig. 15) might be considered to correspond to a transfer member, Shimoda clearly states a heat-fusing adhesive is employed (column 34, line 19) in the embodiment (Fig. 14A-15), while a room-temperature activated adhesive is used in accordance with an exemplary embodiment of the claimed invention. See Specification at page 13, line 27-page 14, line 2.

Both of the references are silent on the room-temperature activated adhesive. On the other hand, the heat-fusing adhesive is not used in the current application in order to prevent the heat applied to activate the adhesive from warping the members of different thermal expansion rates, i.e. a transparent substrate for shielding alpha-ray and a wafer made of silicon. Shimoda is

silent on the negative influence the warp has upon later dicing process since dicing is not employed in Shimoda.

In addition, Hashimoto is related to an optical device and it is difficult to heat up the desired portion in such a device of minute structure.

Accordingly, Appellant submits that the Examiner has impermissibly relied on hindsight reconstruction to improperly combine these unrelated teachings. Further, even assuming for the sake of argument that Hashimoto and Shimoda were combined, neither Hashimoto nor Shimoda, whether taken alone or in combination, would reasonably teach or suggest *at least* the feature of "releasing the transfer member from the transparent substrate to transfer the adhesive, which is applied to the transfer member, from the transfer member onto the plurality of spacers formed on the transparent substrate", as in the method defined by claim 1.

For at least the above reasons, the combination of Shimoda with Hashimoto does not teach the elements of claim 1. Consequently, claim 1 and its dependent claims should be deemed allowable.

Claim 6

Claim 6 recites "wherein the transfer member is peeled off such that the angle between the transfer member and the transparent substrate is kept constant." As discussed above, the peeling layer (transfer member as cited by the Examiner) is such that the bonding strength between atoms or molecules of the material that constitutes the peeling layer 11 is lost or reduced upon irradiation with light, i.e. ablation occurs, leading to in-layer peeling and/or interfacial peeling. Therefore, the peeling layer of Hashimoto is peeled by light irradiation. There is no teaching or suggestion of peeling off the peeling layer so that an angle between the transfer

member and the transparent substrate is kept constant. Specifically since there is no angle of peeling disclosed in Hashimoto. Consequently, claim 6 should be deemed allowable.

Claim 7

Claim 7 recites "forming a ridge pattern or a recess pattern in the transfer member, the ridge pattern or the recess pattern being the same pattern as the spacers in the transparent substrate. There is no teaching or suggestion of forming a ridge pattern or a recess pattern in the peeling layer of Shimoda. Further, it would appear that if a ridge pattern or recess pattern were to exist in the peeling layer of Hashimoto, this would result in a defective transfer of the transfer body 2a as taught in Hashimoto, evidencing that the Examiner's reasoning is merely a result of impermissible hindsight.

Claim 12

Claim 12 recites "wherein the adhesive is applied to the transfer member by bar coating, blade coating or spin coating." Assuming Shimoda could be combined with Hashimoto and further assuming that the transfer member of Shimoda applied an adhesive, it would appear that the peeling layer would be applied through the irradiation of light. There is no teaching or suggestion of bar coating, blade coating or spin coating, as claimed. Consequently, claim 12 should be deemed allowable.

Claim 15

Claim 15 recites "wherein the adhesive has the thickness from 0.5μm to 5.0μm after the adhesive is activated." However, Appellant submits that Hashimoto does not even illustrate the adhesive, let alone describe the thickness of the adhesive. Therefore, it is unlikely that one of skill in the art upon viewing the Hashimoto reference would determine that the thickness of the

adhesive is 0.5μm to 5.0μm after the adhesive is activated. The Examiner's reasoning is clearly a result of impermissible hindsight.

In view of the forgoing, reconsideration and withdrawal of the rejection of claim 1 is therefore requested. As to dependent claims 2-16 and 23, Appellant submits that these claims should be allowable at least by virtue of depending from claim 1, as well as by virtue of the features recited therein.

VIII. CONCLUSION

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Ruthleen E. Uy/

Ruthleen E. Uy
Registration No. 51,361

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: October 31, 2007

CLAIMS APPENDIX

CLAIMS 1-16 AND 23 ARE ON APPEAL:

1. (previously presented): A method for manufacturing a solid-state imaging device by adhering a transparent substrate, in which a plurality of frame-shaped spacers are formed, via an adhesive to a wafer on which plural solid-state imaging elements are formed, and by dividing the transparent substrate and the wafer for each solid-state imaging element, each of the solid-state imaging elements on the wafer being surrounded by each of the plurality of spacers, the method comprising the steps of:

adhering a transfer member, to which the adhesive is applied, to the plurality of spacers formed on the transparent substrate;

applying pressure to the transparent substrate and the transfer member, which is adhered to the plurality of spacers formed on the transparent substrate; and

releasing the transfer member from the transparent substrate to transfer the adhesive, which is applied to the transfer member, from the transfer member onto the plurality of spacers formed on the transparent substrate.

2. (original): The method according to claim 1, wherein the transfer member is a rigid body.

3. (original): The method according to claim 2, wherein the transfer member is a glass plate.

4. (original): The method according to claim 1, wherein the transfer member is an elastic body.

5. (original): The method according to claim 4, wherein the transfer member is a flexible plastic film.

6. (original): The method according to claim 5, wherein the transfer member is peeled off such that the angle between the transfer member and the transparent substrate is kept constant.

7. (original): The method according to claim 1, further comprising the step of forming a ridge pattern or a recess pattern in the transfer member, the ridge pattern or the recess pattern being the same pattern as the spacers in the transparent substrate.

8. (original): The method according to claim 1, further comprising the step of applying a release agent on the surface of the transfer member.

9. (original): The method according to claim 8, wherein the release agent is silicon.

10. (original): The method according to claim 1, further comprising the step of carrying out surface modification to the surface of the spacer to which the adhesive is applied.

11. (original): The method according to claim 1, wherein the viscosity of the adhesive is 0.1 Pa·S or more when the adhesive is applied to the transfer member.

12. (original): The method according to claim 1, wherein the adhesive is applied to the transfer member by bar coating, blade coating or spin coating.

13. (original): The method according to claim 1, wherein pressure is applied to the transfer member and the transparent substrate by air pressure or roller pressure.

14. (original): The method according to claim 1, wherein the viscosity of the adhesive is 100 Pa·S to 10000 Pa·S when the adhesive is transferred to the spacer from the transfer member.

15. (original): The method according to claim 1, wherein the adhesive has the thickness from 0.5μm to 5.0μm after the adhesive is activated.

16. (original): The method according to claim 1, wherein the spacer is bonded to the wafer over the surface to which the adhesive is applied.

17. (withdrawn): A solid-state imaging device manufactured by the method according to claim 1.

18. (withdrawn): The solid-state imaging device according to claim 17, wherein the solid-state imaging element and the inner surface of the spacer are separated by 50μm to 100μm over the whole edge of the solid-state imaging element.

19. (withdrawn): The solid-state imaging device according to claim 17, wherein the width of the spacer is 100μm to 500μm.

20. (withdrawn): The solid-state imaging device according to claim 17, wherein chamfer edges are formed in the surface of the spacer to which the adhesive is applied, the surplus adhesive is contained in the space between the wafer and the chamfer edges.

21. (withdrawn): A solid-state imaging device that comprises a solid-state imaging element on a chip wafer, a frame-shaped spacer bounded on the chip wafer via an adhesive, and a transparent plate on the spacer to seal the solid-state imaging element, the solid-state imaging element being surrounded by the spacer;

wherein the solid-state imaging element and the inner surface of the spacer are separated by 50μm to 100μm over the whole edge of the solid-state imaging element.

22. (withdrawn): A solid-state imaging device that comprises a solid-state imaging element on a chip wafer, a frame-shaped spacer bounded on the chip wafer via an adhesive, and

a transparent plate on the spacer to seal the solid-state imaging element, the solid-state imaging element being surrounded by the spacer;

wherein the width of the spacer is 100μm to 500μm.

23. (previously presented): The method according to claim 1, further comprising the step of bonding the wafer to the transparent substrate by pressing the wafer and the plurality of spacers formed on the transparent substrate, wherein the adhesive transferred from the transfer member onto the plurality of spacers bonds the plurality of spacers to the wafer.

EVIDENCE APPENDIX:

Pursuant to 37 C.F.R. § 41.37(c)(1)(ix), submitted herewith are copies of any evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 or any other evidence entered by the Examiner and relied upon by Appellant in the appeal.

NONE

RELATED PROCEEDINGS APPENDIX

Submitted herewith are copies of decisions rendered by a court or the Board in any proceeding identified about in Section II pursuant to 37 C.F.R. § 41.37(c)(1)(ii).

A copy of the Notice of Panel Decision mailed August 30, 2006 in response to the Request for Pre-Appeal Brief Review filed on July 31, 2006, in enclosed.